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SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF ORANGE – COMPLEX CIVIL

ORANGE COUNTY WATER DISTRICT,

Plaintiff,

vs.

NORTHROP CORPORATION, NORTHROP GRUMMAN CORPORATION; AMERICAN ELECTRONICS, INC.; MAG AEROSPACE INDUSTRIES, INC.; GULTON INDUSTRIES, INC.; MARK IV INDUSTRIES, INC.; EDO CORPORATION; AEROJET-GENERAL CORPORATION; MOORE BUSINESS FORMS, INC.; AC PRODUCTS; FULLERTON MANUFACTURING COMPANY; FULLERTON BUSINESS PARK LLC and DOES 1 through 400, inclusive,

Defendants.

AND RELATED CROSS ACTIONS

Case No. 04CC00715

NORTHROP GRUMMAN SYSTEMS CORPORATION'S CLOSING BRIEF AND PROPOSED FINDINGS

Dept: CX-104
Judge: Hon. Kim G. Dunning

Complaint Filed: December 17, 2004
Trial Date: February 10, 2012

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I. INTRODUCTION

Despite a 53-day trial spanning five months, the District has failed to establish the most basic and essential element of its two statutory causes of action, namely, the element of causation. Recovery for remedial action costs under the OCWD Act may be made only from persons who caused the District to incur reasonable and necessary remedial action costs. (Cal. Water Code App. § 40-8 (c).) Recovery under the HSAA similarly is limited to indemnity or contribution from an owner or operator of a facility at which a release of a hazardous substance actually caused the District to incur necessary response costs. (HSAA § 25363 (e); *Carson Harbor Village Ltd. v. Unocal Corp.* (9th Cir. 2001) 270 F.3d 863, 871.)

Simply put, the District has failed to prove causation, an essential element of its prima facie case, and hence judgment should be granted accordingly. The District failed to present evidence demonstrating that its remedial action costs were necessitated by contaminant releases from any of the three Northrop Grumman ("Northrop") sites. Rather, the evidence shows that Northrop's EMD site is not a source of any groundwater contamination and, consequently, it cannot be a cause of any necessary remedial costs. Nor have remedial action costs been necessary to address contamination from the Kester or Y-12 sites, both of which are being fully remediated under the supervision of the Regional Water Quality Control Board ("Regional Board"). The Regional Board, unlike the District, is the state agency responsible for contamination cleanup in California, and it is the governing body responsible for regulating contaminated sites.

EMD, the largest of the three Northrop sites, was fully remediated in 1991. Since that time hundreds of soil and groundwater samples have been taken affirming the conclusions reached by both the Regional Board and the District that EMD is not a source of groundwater contamination. The District's own groundwater sampling in 2010 further confirmed that no residual contamination exists requiring remediation by OCWD's proposed system. Indeed, Dr. Waddell ("Waddell") admitted that the low levels of contamination in the groundwater beneath EMD are consistent with

contamination resulting from upgradient sources.

Northrop does not dispute that contaminant releases of PCE at Kester and TCE at Y-12 impacted groundwater, but the evidence shows Northrop is already remediating those releases under Regional Board supervision. During the several decades while OCWD took no action to address the groundwater contamination, Northrop undertook its own extensive cleanup efforts under Regional Board's supervision. At Y12, for example, Northrop is effectively remediating the groundwater to drinking water standards through an innovative circulation well system

As to the Kester site, the Regional Board has issued a no further action letter for soil closure, and it is reviewing a remedial action plan for remediation in the perched zone. The most recent data indicates that soil remediation has been extremely effective. In addition to any active remediation required by the Regional Board, the insitu groundwater remediation project located immediately downgradient the Y12 site will capture any residual PCE that conceivably emanates from Kester.

Consequently, none of OCWD's past investigative activities or proposed remedial costs were or are necessary to address contamination from Kester or Y-12 because releases from those sites already have or are being effective rectified. Northrop is fully remediating Kester and Y-12 and remediation activities will only be completed when the Regional Board is satisfied that these two sites do not pose any threat to groundwater. Whether OCWD's North Basin treatment project is ever built is irrelevant to the quality of water emanating from the Northrop facilities.[1]

Apparently frustrated by what it perceived as slow action by the Regional Board, OCWD's prior management aggressively embarked upon a multi-million dollar

[1] At some point during the early 2000s, OCWD decided to embark upon its own cleanup. A decade later, OCWD has remediated nothing. In testimony from Roy Herndon and David Mark, it is clear that the regional project is aimed at addressing problems well beyond Northrop or to capture contaminants not yet identifiable or regulated. However laudable those goals, the OCWD Act and HSAA only permit reimbursement to be ordered for costs actually tied to releases necessitating remediation.

oversized regional project with the apparent belief that Northrop would be jointly and severally liability for all cleanup costs regardless of whether it contributed to them. Ironically, OCWD itself has failed to clean up a single molecule in the 10+ years it has been designing the Project while Northrop has effectively treated its releases. Even if the Court were to take sympathy on the dilemma OCWD's new management now faces and determine that some of the remedial action costs incurred were necessary as a result of Northrop's contamination, the undisputed evidence establishes that an allocation of costs as to Northrop is both legally required and fair.

Northrop's expert evidence establishes a reasonable basis for the court to allocate a share of 1.8% to Northrop on a cost allocation basis or a share of 4.0% on a VOC volumetric basis. In any event, Northrop's liability should be no greater than what a dedicated VOC cleanup downgradient of Y-12 and EMD would have cost when approved by the district board in 2001, namely, approximately $1 million per extraction well including capital costs and operations and maintenance.

Allocation is more than appropriate given the trial evidence. First, the Project area covers approximately four and a half square miles, most of which are upgradient or cross-gradient of Northrop. Second, by OCWD's own admission, approximately fifty percent of the Project costs are for the cleanup of perchlorate and nitrate contamination for which the District itself is responsible and for the treatment of dioxane, TCP, and DCA. OCWD produced no credible evidence that Northrop ever used or released any of these constituents. Northrop is responsible for the damages caused by Northrop, if any, and it should not be legally obligated to pay for damage caused by others or by the district itself.

II. THE DISTRICT HAS FAILED TO PROVE THAT CONTAMINANT RELEASES FROM NORTHROP SITES HAVE CAUSED THE DISTRICT TO INCUR NECESSARY COSTS

Northrop owned or operated three sites all located in the far western portion of the Project area; EMD is located at 500 East Orangethorpe Avenue, Anaheim; Y-12 is located at 301 East Orangethorpe Avenue, Anaheim; and Kester Solder is located at 1730

North Orangethorpe Park, Anaheim. EMD and Y-12 are contiguous and Kester Solder is approximately 1,500 feet to the east. (Transcript, (RT) 5197:3-16.)

A. EMD is Not a Source of Groundwater Contamination

The EMD facility is the largest of the three Northrop sites. (RT 5196:25-5197:5.) Northrop purchased the EMD site in 1951. (RT 1639:15-19.) There were several buildings on the site, the largest of which was the Y-1 building, which was about 250,000 sq. feet, located along the northeastern portion of the property. (RT 1660:23-1661:3.) A degreaser was operated within the anodic room in Y-1; there were also degreasers in the Y-2 building, which was south of the Y-1 building and towards the central portion of the property. (RT 1661:12-21.)

Northrop operated the EMD facility for 38 years and used TCA and TCE in its degreasers for the vast majority of those years. (RT 5445:16-22.) TCA was used as a solvent at EMD for approximately 11 years and TCE was used for approximately 36 years. (RT 5447:11-20.) There were releases of both TCE and TCA at EMD. (RT 1642:8-12; 5272:17-22.) The releases were primarily in the Y-1 building at and near the anodic room. (RT 1643:8-20; 5272:20-22.) There were also releases in wastewater. (RT 1643:12-20; 5446:2-10.)

OCWD presented no evidence that PCE was ever used at EMD. Waddell repeatedly acknowledged that Monitor Plating (located to the east and upgradient of EMD) is the source of all PCE contamination found in the groundwater beneath EMD and that Monitor Plating also is the source of some of the TCE contamination found in the groundwater. (RT 1665:13-1666:4; 1696:16-24; 2768:9-12.)

Upon discovery of contamination at the site, Northrop's consultants performed a comprehensive investigation. Site closure occurred in 1991 at which time all on-site buildings were demolished and removed which allowed the site to be more thoroughly characterized. (RT 5275:24-5276:9.) More than 1,600 soil samples and soil vapor samples were collected by Northrop and its consultants from 130 different sampling points. (RT 5274:5-21.)

Northrop further undertook extensive remediation. Specifically, Northrop excavated the soil contamination, performed detailed site assessment, installed and operated an extensive soil vapor extraction system and then further excavated again down to a clay layer to a depth of approximately 40 ft. (RT 5276:10-5277:5.) Remediation activities were performed under the supervision of both the Regional Board and the Orange County Health Care Agency ("OCHCA") and a cleanup standard of a total VOC concentration of 1ppm was established for the site. (RT 5278:20-5279:13.) Cleanup standards are set by the Regional Board based upon its determination of the level of contamination that could pose a threat to groundwater. (RT 2720:18-22.)[2]

Following completion of remediation and closure, both the Regional Board and the OCHA issued no further action letters. (RT 2720:22-26, Exhibits ("Ex.") 12613 and 15314.) In its no further action letter, the Regional Board stated that remediation activities "indicate that the VOCs that remain in the soil at the site do not appear to be present in concentrations that would result in a significant impact on water quality". (Ex. 12613-1.) Even Roy Herndon, the District's chief hydrologist, admitted at the time that the soil cleanup at EMD was "a thorough and comprehensive project from a soil remediation standpoint and Northrop can be commended for this effort." (Ex. 1445-2.) Not surprisingly, Waddell failed to consider OCWD's previously articulated opinion in reaching his conclusion on site characterization. (RT 2723:8-2724:3.)

After obtaining the "no further action" letter 1991, Northrop conducted additional groundwater monitoring for several years and the results were reported to the Regional Board. The Regional Board concluded in 1993 that "contaminants in groundwater beneath the site probably originate from an off-site source." (Ex. 11459-1.) Accordingly, the Board authorized Northrop to abandon the monitoring wells at the site except for MW-8 and MW-9, (later named AM-42 and AM-42A) which Northrop transferred to the

[2] Notably, the California State Department of Toxic Substance Control overseeing cleanup at the Johnson Control site located within the project area established a substantially more liberal cleanup goal of 1.3 parts per million (1300 ppb). (RT 2725:19-2726:13.)

District pursuant to an agreement entered into with the District. (*Id.* RT 2747:13-19.) Indeed, the District itself concluded that "on-site groundwater contamination may have originated from an unknown upgradient source east of the Northrop site." (Ex.15325-2.) In addition, approximately 600 soil samples were collected at the site after closure and none exceeded the approved cleanup level. (RT 5288:13-21; 2724:12-2725:8.) The EMD site investigation was very rigorous. Northrop's expert Tofani testified that he has never seen a site more heavily investigated than EMD in his many years of experience. (RT 5288:22-24.) The property was subsequently sold and redeveloped.

1. OCWD Presented No Credible Evidence that Activities at EMD Have Caused the District to Incur Any Remedial Action Costs

Waddell's opinion that TCE and DCE contamination at EMD is a cause of the District's remedial action costs is based upon sampling data taken prior to remediation at the site in 1991. Waddell mistakenly testified that there were TCE concentrations at EMD of 140 ppb that required remediation. (RT 1684:18-1685:5.) On cross-examination, however, he acknowledged that the sample of 140 ppb was taken in 1989 (RT 2727:26-2728:2.), and that no sample taken at any monitoring well at EMD over the past twenty years has shown levels even as high at 40 ppb. (RT 2729:12-2730:3.) Again under cross-examination, he conceded that the earlier 140 ppb sample result also showed a PCE hit of 9ppb that was attributable to Monitor Plating. Finally, Waddell acknowledged that he was unable to determine the extent to which Monitor Plating had contributed to the TCE sample showing 140 ppb. (RT 2731:1-6, 2732:4-7; 2733:5-8.)[3]

More significantly, Waddell admitted that the OCWD proposed treatment plant will not capture or treat any of the groundwater containing elevated TCE concentration which may have been present in the groundwater when sampling was conducted in the late 80's because any contaminated water that passed beneath EMD at that time has long since migrated beyond the District's extraction wells. Waddell testified that EW-4 (if it is

[3] Waddell also testified that a DCE concentration of 156 ppb was measured at the site. That sample, however, was taken in July 1988, long before remediation. (RT 2739:17-2740:8.)

ever operated) will capture only water that is either currently passing through EMD or will soon be passing through EMD. (RT 2738:17-2739:16.)

That EMD is fully remediated is beyond any credible argument. In 2010, the District, performed additional soil and groundwater sampling and testing at EMD. Waddell was responsible for selecting the location of sampling sites and chose locations based upon his determination as to where the greatest contamination had occurred or was expected to be found at the site. (RT 2734:8-11; 2735:6-16.) Fifty-five soil samples were collected and none showed VOC levels in excess of the cleanup goal of 1ppm. (RT 2725:9-18; 5288:13-21.)

Further, the groundwater sampling taken in 2010 completely refutes the notion that past releases at EMD have caused OCWD to incur any remedial action. Waddell admits that the 2010 groundwater samples demonstrate only low levels of contamination and that these low levels are entirely consistent with levels of contamination coming onto the site from upgradient sources. (RT 2736:20-2737:3; 2741:13-22.) The highest concentration of TCE at any of the samples taken in 2010 was 4 ppb which is less than the MCL and consistent with upgradient sources. (RT 2736:20-23.) The highest concentration of DCE in 2010 was 7.3 ppb, which is slightly above MCL, but no higher than DCE concentrations from groundwater samples upgradient of EMD. (RT 2741:13-15.) This data plainly demonstrates that there is no perceptible contribution from the EMD site to groundwater contamination as groundwater passes below EMD. (RT 5305:5-11.)

2. EMD Is Not a Source of Groundwater Contamination at EW-4

Waddell acknowledged that the redevelopment of the property and the remediation activities in 1991 resulted in a substantial improvement in water quality beneath EMD, as evidenced by the decreasing levels of contamination. (RT 2743:18-22.) Waddell also acknowledged that since 2000, there has been a further significant decrease in TCE and DCE concentrations in groundwater beneath EMD. (RT 2741:1-12.) He acknowledged that unlike the experience common at other sites where rising water levels

result in a spike in contaminant levels, no spike of VOC concentrations have been observed at EMD. (RT 2742:14-2743:17.)[4]

The primary basis for Waddell's opinion that EMD had been a source of DCE contamination was his conclusion that there was too much TCA found under EMD in the 1980's and early 1990's to indicate an upgradient source of that contamination given the half-life of TCA and the degradation rate of TCA to DCE. (RT 1680:5-1681:22.) Waddell testified that the half-life of TCA is based upon groundwater temperature and that at EMD, the half-life of TCA was 1.7 years. (RT 2713:5-14.) In concluding that no upgradient source could have been responsible for the TCA found underneath EMD in the 1980s and early 1990s, Waddell testified that he did not consider sampling taken at well pairs AM-40/40A and AM-42/42A. He acknowledged that these two well pairs were both upgradient of EMD and that both showed significant TCA contamination. However, he opined that EMD was the source of the contamination at these well pairs based upon his theory that a water leak at EMD "mounded" beneath the area of the anodic room creating a perched zone that moved laterally upgradient to the east to a point near AM-42 where that perched contaminated water entered the groundwater. (RT 1651:24-1652:12; 1701:8-1702:13.) Both Waddell's "age dating" and "mound" theories have been thoroughly discredited by other experts, however.

On cross-examination, Waddell admitted that the TCA half-life of 1.7 years relied upon by him is based upon a single study and that other scientific studies finding the half-life to be twice as long contradicted his conclusions. He also conceded that half life varies depending upon temperature and pH. (RT 3309:7-3310:8.) (RT 3310:9-3311:3.)

Glenn Tofani tried to replicate Waddell's conclusions and performed a similar evaluation of the TCA found in the groundwater beneath EMD in the late 1980s and early 1990s utilizing Waddell's age dating analysis. He determined that the TCA was

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[4] In fact, the only spike that occurred was a PCE spike from a release at Monitor Plating, not EMD. (RT 2743:9-17.) This is further evidence that EMD is not a source because, as Tofani testified, contaminant levels at EMD would have increased following a rise in the water table if EMD had been a source. (RT 5320:22-5322:3.)

too old to have originated from EMD. Tofani testified that the data indicated a source of TCA several thousand feet upgradient of EMD in the area of Crucible, pointing out that Waddell himself had identified Crucible as a source of TCA contamination found at EMD. (RT 5326:24-5327:21.)

Waddell's opinion that EMD was the source of the TCA found in the well pairs AM-40/40A and AM-42/42A, based upon his "mound" theory, should be rejected because no data supports it. As Tofani pointed out, Waddell's theory assumes that the contaminated perched water beneath the anodic room travelled upgradient to the east for about 650 feet and then entered the groundwater at or about AM-42/42A. However, the well pair AM-40/40A is more than 500 feet farther east of AM-42/42A and is simply too far upgradient to have been impacted by any mound of contaminated water entering groundwater at AM-42/42A. (RT 5331:3-17.) Furthermore, in all of the well pairs both upgradient and downgradient EMD, deep VOC levels are higher than shallow VOC levels. This is inconsistent with the mound theory, which would have required a shallow plume to be created as the contaminated perched water entered the shallow aquifer in the area of AM-42/42A. (RT 5331:18-5332:3.) Moreover, if contaminated mounded water had entered the groundwater at or near AM-42/42A, higher concentrations of contaminated groundwater should have been present in FM-7A (downgradient) than in AM-40A (upgradient), and they are not. (RT 5332:4-18.)

Even more significant is the absence of any perched water in almost all samples taken at the EMD facility, both in the late 1980s while the facility was in operation and in 1991 at the time of the no further action letter. The mounding theory would have required that there be a very extensive perched groundwater zone across the site in order to create a mound extensive enough to force groundwater to travel as far as 1150 feet upgradient to the east. The absence of evidence of such a perched zone is wholly inconsistent with Waddell's mounding theory. (RT 5333:11-19; 5334:2-5335:2; 5335:9-18.) Waddell apparently invented his "mounding" theory to avoid using the AM-40/40A and AM42/42A well pairs as upgradient sources because using these points leads

to the inevitable conclusion that upgradient sources adversely impacted EMD.

Comparing data from these two well pairs and also the upgradient well pair AM-39/39A with data from downgradient well pairs FM-7/7A and FM1/1A conclusively demonstrates an upgradient source of the TCA found at EMD in the late 1980s and 1990s. This data also establishes that upgradient concentrations of TCE are similar to or slightly greater than downgradient concentrations. (Ex. 15723-1, RT 5303:5-21; Ex. 15723-2, RT 5304:18-5305:11.)

That EMD is not a source of VOC contamination requiring cleanup by OCWD's system also is demonstrated by the VOC levels measured in the shallow, onsite monitoring wells. As Glenn Tofani explained, if VOCs in the soil at or near the anodic room impacted groundwater, elevated and potentially very elevated TCE levels should have been detected near the surface of the aquifer at that location when, in fact, only very low levels of TCE were detected. (Ex. 15724-1, RT 5310:23-5311:24.) Moreover, the fact that VOC concentrations were higher at every well pair in the deep screen wells than in the shallow wells is also indicative of a distant source. If EMD had been a source of groundwater contamination, concentrations of contamination should have been greater in the shallow screen wells than in the deep screen wells. (Ex. 15724, RT 5312:26-5314:2.) For example, at the AM-42 well pair, which is close to Monitor Plating (the source of PCE contamination under EMD), concentrations of PCE are significantly higher in AM-42A, the shallow screened well, than in AM-42, the deep screened well. (Ex. 15725, RT 5316:12-5317:23.)

The response of VOC levels to rainfall in the upgradient and downgradient wells further supports the conclusion that EMD is not and was not a source of groundwater contamination. If EMD were a source, contaminant levels should have spiked within a couple of months after groundwater levels begin to rise. (Ex. 15726, RT 5320:22-5321:24.) Despite very significant rainfall in the 2004-2005 timeframe, no spike in contaminant levels around EMD occurred, except for the PCE spike in AM-42A, which is close to the PCE source at Monitor Plating. (RT 5323:9-16.)

The District also unsuccessfully argued at trial that EMD was a source of 1,4 dioxane (dioxane) contamination. This assertion is based upon one unreliable "grab" sample taken by the District downgradient EMD (NESD-GW1) in May 2009, which supposedly showed a dioxane concentration of 11.7 ppb. Based on this one unreplicated sample, the District contends that EMD is a source and that data point is higher than any upgradient dioxane concentrations.[5] The District is simply wrong on both counts. Indeed, in making this assertion, the District is impeaching its own expert Waddell who, when asked to identify the contaminants from EMD that impacted groundwater, listed *only* TCE and DCE. (RT 1685:6-15.) In fact, Waddell opined that Vista Paint, a source upgradient of EMD (and upgradient of NESD-GW1), was responsible for dioxane contamination and was the source of the largest dioxane reading anywhere in the Project area, namely, 691 ppb. (RT 1983:16-1984:1; 2831:11-23.)

The most significant source of dioxane in the Project area is the UOP facility which released enormous quantities of dioxane to the sewer system. Steve Griffith, UOP's plant manager confirmed that UOP used more than 15,000 lbs. of dioxane annually and that almost all of it was discharged to the sewer system. (Ex. 15857, pp. 3-7.) Further, Fogg's particle tracking analysis shows that dioxane from UOP would have migrated and traveled through EMD. (RT 3836:9-10; 3837:19-20; 3838:15-3840:10; 3841:2-8.) Even Adam Hutchinson, a former OCWD project manager, admitted that UOP was the source of a substantial plume of dioxane. (RT 4564:16-22.) And, finally, as Northrop's expert, John Lambie, testified, contaminant levels of dioxane upgradient of EMD were higher than the 11.7 ppb detection at the downgradient grab sample at NESD-GW1, and that Northrop was not a contributor of dioxane to groundwater. (RT 6593:4-8; 6732:32-6733:4; 6735:15-6736:9.)

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[5] Dioxane does not have a MCL. It has a notification of 1 ppb and a removal limit of 35 ppb. (RT 572:13-16; 6744:16-6745:6).

3. There Is No Contamination from EMD That Meets the Remediation Objective for EW-4

OCWD's extraction wells were installed at locations to capture areas of greatest future threat (Ex. 708-22.) Thus, the Project was designed to have extraction wells located and operated in capture areas where VOC concentrations exceeded ten times MCLs, except for EW-4, which was to be located in an area where VOC concentrations were greater than five times MCLs. (*Id.*; RT 2079:10-17.) It is indisputable that EW-4 is unnecessary under the District's own remedial action objectives. (RT 5341:2-5342:2.) Waddell, himself, acknowledges that TCE contamination beneath EMD is below the MCL and that DCE contamination is only slightly above MCL and that both these levels are no higher than the levels upgradient EMD. (RT 2736:20-2737:3; 2741:13-22.) Any contention that EMD is a source of the dioxane to be treated by EW-4 is baseless. As set forth above, the evidence clearly establishes that EMD is not a source of dioxane contamination. Moreover, the drinking water standard for dioxane is 35 ppb (RT 4804:4-16), and there is no evidence that dioxane has been detected at any level above 6.2 ppb in EW-4. (Ex. 953-14.) Plainly, the source of this dioxane is either Vista Paint or UOP or both. It is certainly not EMD. (RT 2831:11-20.)

Thus, there is no contamination from EMD that even reaches MCL or the NL for dioxane. Therefore, there is no contamination from EMD that has been or will be captured by EW-4. EW-4 is not necessary, not only because EMD is not contaminating the groundwater but also because contaminant levels from any source that would be captured by EW-4 are less than five times MCL. In short, the District has failed to prove that EMD is a source of groundwater contamination requiring any remediation.

B. Kester Is Not A Current Source of Groundwater Contamination

1. The Contaminated Soil at Kester Has Been Fully Remediated

Northrop acquired the Kester site in 2001 at or about the time operations at the site ceased. (RT 1351:22-1352:25.) PCE was stored at the site in 55 gallon drums in a chemical storage area on the east side of the chemical mixing and storage room, and PCE

was mixed and repackaged at the site. (Ex. 1051-2.) Releases of PCE occurred in the drum storage area along the eastern edge of the site. (RT 5197:18-24.) Early testing at the site determined that there was PCE in the shallow soil, perched zone and groundwater under the site. (RT 1302:9-15.) Prior to remedial activities at the site, PCE concentrations in the shallow aquifer beneath Kester were 160 ppb. (Ex. 15713-3, RT 5216:13-5217:1.)

As with the EMD site, Northrop commissioned an extensive soil and groundwater investigation at Kester. (RT 5201:2-12.) The Regional Board approved Northrop's investigation and a pilot test for soil remediation. (RT 5202:2-21.) The pilot test was successful and led to a remedial action plan ultimately approved by the Regional Board. (RT 5202:25-5203:10.) Northrop implemented the soil vapor extraction (SVE) system from October 2007 until June 2009 removing almost 1,000 pounds of VOCs. (RT 5205:4-17.) The Regional board issued a no further action letter regarding soil on December 17, 2010. (RT 5205:14-23, 1337:15-1338:7.)

According to Tofani, the most significant effect of the soil cleanup was to remove the source of potential groundwater contamination. (RT 5206:8-12.)

2. The Perched Zone Contamination Will Be Remediated By Northrop

Contamination remains in the perched zone, and Northrop has conducted several pilot tests to determine the most effective methodology for rectifying it. Northrop completed a pilot test involving an injection of potassium permanganate to remove the PCE from the perched zone. (RT 5206:13-5207:7.) Unfortunately, water levels dropped making this type of remediation extremely difficult. Consequently, Northrop attempted a second pilot test using a dual phase extraction system or a combination of SVE and water extraction. (RT 5207:8-15.) Although Northrop submitted a Remedial Action Plan (RAP) to the Regional Board proposing the dual phase extraction system, before the system could be implemented, groundwater levels again rose and are now back to their original level or even higher. (RT 5207:16-24.) Because of the changes in water

elevation, Northrop once again has revised its RAP and has submitted a revised RAP to the Regional Board involving the injection of sodium permanganate to oxidize the PCE. (RT 5208:5-12.) The Regional Board is currently evaluating the proposal, (RT 5208:13-15), and will oversee Northrop's remediation of the perched zone. Rather than be criticized for its efforts (as OCWD did at trial), Northrop's attempts to target a cleanup with the most appropriate technologies should be applauded and, at a minimum, demonstrates Northrop's commitment to take responsibility for the contamination caused by it, or companies acquired by it.

Although contamination in the perched zone remains to be addressed, PCE concentrations have fallen substantially since completion of soil remediation. For example, at MW-1-95 (within the perched zone), concentrations have fallen from a high of nearly 2,500 ppb in 2008 to 600 ppb at the most recent sampling occurrence in August 2011. (RT 5215:14-5216:8.)

3. Kester No Longer is A Source of Groundwater Contamination

Northrop acknowledges that its predecessor, Litton Industries, engaged in activities that caused impacts to groundwater; however, as with the other two properties, Northrop has diligently undertaken site investigation and remediation so that Kester no longer poses a threat to groundwater. Prior to soil remediation, PCE levels were higher at and downgradient of Kester, than were PCE levels upgradient Kester and coming onto the site.[6]

OCWD and Northrop disagree as to whether Kester remains a source of groundwater contamination since completion of the soil remediation. Although Waddell claims that it is (RT 1348:10-16), the weight of evidence is against him. Waddell testified that upgradient concentrations are three times lower than downgradient samples, indicating an onsite source. (RT 1348:2-9.) He gave no specifics. Tofani, however,

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[6] It is undisputed that PCE from upgradient sources contribute to the PCE at Kester, with the Moore Business Forms site being a likely upgradient source. (RT 1300:9-17; 1327:24-1328:10; 1348:2-9.)

actually compared current contaminant levels in each of the four monitoring wells on the Kester property with contaminant levels from all upgradient wells. The most recent testing shows PCE concentrations in the four monitoring wells screened in the shallow aquifer beneath Kester of 25 ppb (for MW-1 and MW-2) and 24 ppb (for MW-3 and MW-4). (RT 2813:11-19; Ex. 15765-A, Table 2.) These concentrations are consistent with the concentrations from all upgradient wells, which show PCE levels of approximately 25 ppb. (RT 5221:16-21; Ex. 15714-2.) One such example is FM-5 located approximately 1,000 ft. upgradient of Kester which has averaged PCE concentrations of 25 ppb (or more) for many years. (RT 5213:9-5214:8; Ex. 15713-1.)

Monitoring wells downgradient of Kester also show similar levels of PCE. The closest downgradient monitoring well is approximately 1,500 ft. downgradient at Y-12 and shows similar levels of 25 ppb. (RT 5223:18-5224:12.)

The experts also disagree on the extent to which PCE contamination from Kester has impacted groundwater. Waddell testified that PCE contamination from Kester has been detected in sampling at EW-3 because Kester is the nearest source of the PCE at EW-3. (RT 1339:15-1340:4.) Under cross-examination, however, this testimony was impeached when Waddell admitted that the Aero Tech site and the Aero Scientific site, both of which Waddell acknowledges as sources of PCE contamination, were upgradient of and closer to EW-3 than Kester. (RT 2817:10 -2818:6.)

The simple truth is that soil remediation has not only removed PCE from the soil, it also has reduced the source of further PCE contamination from Kester to the groundwater. (RT 5217:2-4.) As a result, Kester is not contributing to PCE contamination in the shallow aquifer. (RT 5208:19-25; 5224:2-12.) In addition, any residual contamination in the perched zone will be remediated under the supervision of the Regional Board. Even assuming that any groundwater contamination were to escape the Kester site, the Y12 insitu circulation treatment well will capture it. Tofani explained that if any contamination from Kester were to migrate downgradient, that contamination would flow beneath the Y-12 site so that any system installed at or beyond Y-12 would

also deal with potential contamination from Kester. (RT 5343:7-26.) Waddell agrees that the same extraction well that addresses Y-12 contamination will also address any Kester contamination. (RT 1341:14-20.) Fogg himself conducted modeling that established the efficacy of the Y-12 extraction well. (Ex. 15977, p 10-11.)

C. Releases at Y-12 Did Not Cause the District to Incur Necessary Remedial Action Costs

1. Y-12 is Not a Source of PCE Contamination

Y-12 was constructed in 1962. Operations at the site ceased in 1994. (RT 1354:11-15; 1355:13-18.) Operations required both the use of a degreaser and a quench tank, which was used to cool the floor beams after heat treatment had been applied. (RT 1358:3-17.) The quench tank was cleaned periodically with TCE. (RT 1358:16-17.) It is undisputed that there were releases of TCE in the area of the quench tank that have impacted groundwater. (RT 5225:2-4.) PCE was not used by Northrop at Y-12. (RT 2778:23-25; Ex. 1041-19.)

Relying on data from the Membrane Interface Probe ("MIP") taken by Northrop's consultant, Waddell initially testified that Y-12 not only is a source of TCE but also PCE contamination. During direct examination, Waddell opined that the higher levels of PCE in the shallow soils pointed to Y12 being the source of contamination on its site as well as on the adjacent Aero Scientific site. This testimony was thoroughly impeached on cross-examination, however, when Waddell admitted that facts were "the exact opposite" of what he had testified to on direct and that, in truth, the shallowest significant contamination and the highest soil concentration of PCE was on the Aero Scientific property. (RT 2797:10-16.) Moreover, Waddell also failed to take into consideration extensive soil gas data testing performed at the time of the MIP tests, which also pointed to Aero Scientific as the PCE source. (RT 2797:17-2801:10.) Simply stated, Y-12 is not a source of PCE groundwater contamination. (RT 5240:12-21.)

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2. Site Remediation Is Near Completion

After Northrop closed its operations, it commenced a site investigation followed by a limited initial investigation, which did not identify any significant soil contamination. Based on that data, the Regional Board issued a no further action letter for soil, but it required ongoing groundwater monitoring. (RT 5225:17-5226:7; 5226:8-24.) The Regional Board ultimately withdrew its no further action letter because the groundwater data signaled that an onsite source remained. After that withdrawal, a thorough investigation was performed to characterize and to delineate the extent of contamination. (RT 5226:25-5228:16.)[7] By 2008, the investigation had been completed and Northrop had prepared and obtained approval from the Regional Board of a RAP providing for SVE and dual phase extraction. (RT 5243:9-5244:7.) The remedial system was started in August 2008, and, to date, has extracted, approximately 20,000 lbs. of VOCs (RT 5244:17-19.) Recent modeling results indicate that 98% of the contamination at the site, (including the contamination in the perched zone) has been remediated. (RT 5246:2-15.) Soil remediation is targeted for completion by 2014, at which time the site will no longer be a source of groundwater contamination. (RT 5246:16-26.)

3. Because Northrop is Remediating the Groundwater, EW-3 Is Unnecessary

Northrop is actively remediating groundwater at the Y12 site. (RT 5247:1-6.) With approval from the Regional Board, a circulation well was installed on the downgradient edge of the property to capture and decontaminate VOC impacted groundwater from the shallow zone. (RT 5247:8-23.); (RT 5252:11-20.) The initial circulation well process generated a byproduct called bromate, which was not detected for several months. As soon as it was discovered, the process was modified, and the well has now been successfully treating contamination for over a year. The new system uses ultraviolet light instead of zone. (RT 5252:23-5253:18.; 5266:13-21.)

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[7] Waddell, himself, acknowledged that Y-12 is the most monitored site in the project area. (RT 655:15-19.)

Tofani testified that the circulation well has been effective in reducing VOC to drinking water standards. (RT 5267:4-9.) Tofani further testified, based on data from downgradient monitoring wells, that the contaminants have dropped significantly in response to the soil and groundwater remediation activities. (RT 5267:10-17.) Current estimates are that remediation of the perched zone will be complete within two years (2014), at which point the circulation well will no longer be necessary because the site will no longer be a source of elevated VOCs. (RT 5272:5-15.) Until then, the Regional Board continues to oversee Northrop's remediation activities.

Even OCWD's expert Dr. Fogg ("Fogg"), applauded the efficacy of the circulation well process. Fogg acknowledged that treatment at CW-1 (Northrop's circulation well) will be successful in reducing contaminant levels to below MCLs. And, importantly, his modeling showed the circulation well was more effective in reaching MCLs than EW-3. (Ex. 15977, p. 10-11.)

Based on this evidence, it is clear that EW-3 is not necessary to address Y-12 contamination because the source of the contamination at Y-12 has almost completely been removed and CW-1 will continue to operate until the site is no longer a source of groundwater contamination. (RT 5342:18-5343:6.)

III. ALTERNATIVELY, IF NORTHROP HAS ANY LIABILITY, THE EVIDENCE HAS ESTABLISHED THAT ALLOCATION IS PROPER

Northrop's expert, John Lambie provided a detailed allocation analysis appropriate for the facts of this case; his allocation analysis assumed that the District project is necessary, a proposition with which Lambie vehemently disagrees. (RT 6462:9-19.) Lambie's analysis was also based on the assumption that the District had incurred remedial costs of $3.5 million dollars for extraction wells, monitoring wells, and consulting costs in connection with the remediation project.[8] (RT 6520:5-23.)

[8] Moreover as said forth in the common brief, Northrop's contributions to VOC contamination do not warrant a centralized treatment – treating upgradient sources and contaminates that Northrop did not use.

A. A Reasonable and Proper Basis Exists to Allocate 1.8% of the District's Incurred Remedial Action Costs to Northrop

Lambie testified that remedial action costs are commonly allocated among multiple parties in commingled plumes. (RT 6520:24-6521:25.) The "standalone" cost allocation method which he employed is well-described in the literature and is generally accepted among environmental engineers. (RT 6521:26-6523:1.) This method allocates liability based upon the cost of treatment for each chemical. (RT 6523:2-6524:5.)

The United States Supreme Court approved this method in *Burlington Northern & Santa Fe Railway Co., v United States*, (2009) 556 US 599. In *Burlington*, the Court approved apportioning the costs of remediation as opposed to apportioning the contamination. (*Id.* at pp. 615-619). (See also Cal. Health & Safety Code §25363 which similarly provides for allocation by remediation costs.)

Lambie calculated the treatment costs for each of the eight chemicals to be remediated by the project based on the District's own costs.[9] Cost allocation involved prorating the District's costs for the area affected by the chemical to be treated. (RT 6525:22-6525:3.) Lambie utilized the District's treatment objective for VOCs of five times the MCLs and then determined which part of the extraction well system and pipeline would be necessary for the treatment of each chemical in order to arrive at a total treatment cost for each chemical. (RT 6528:10-6529:14; 6532:7-20.) Lambie determined, for example, that only three of the wells (EW-1, 2, and 2A) would be necessary for the treatment of perchlorate. (RT 6535:7-13.)

Utilizing the district's own capital and operation and maintenance costs, Lambie determined the cost to treat separately, on a standalone basis, each chemical as if it were the only chemical being treated. (RT 6537:25-6538:5.) (RT 6538:3-11.) Based on this approach, Lambie determined the portion of the project costs allocable to each chemical by adding up the total remediation costs for all of the eight chemicals and dividing that

[9] These are TCE, PCE, DCE, 1, 4 dioxane, perchlorate, nitrates, trichlorpropane (TCP) and dichloroethane (DCA). (RT 6523:13-6524:5.)

total by the costs for each of the chemicals. (RT 6538:12-6539:11.)

Having determined the percentage of treatment costs for every chemical, Lambie then calculated Northrop's contribution of each chemical by performing a mass calculation to determine the total mass of each of the chemicals in the Project area and then the percentage of that mass contributed by Northrop. (RT 6549:11-6550:23.) This is a widely accepted methodology. (RT 6551:4-6; 6553:16-6554:5.) Lambie also utilized the model prepared by plaintiff's expert, Fogg, to determine where the outer limits of capture would be for the District's extraction wells. (RT 6552:3-10.) Lambie's natural attenuation rates were based upon studies and EPA guidance documents from which he calculated attenuation rates for each of the chemicals. (RT 6479:17-6481:7.)[10]

Lambie next calculated Northrop's possible contribution to that plume based upon the actual mass of each chemical plume. For example, at EMD, he looked at concentrations of TCE both upgradient EMD facility and downgradient the facility (adjusted for natural attenuation) to see where it was likely that EMD contributed TCE to the plume and then, if so, what percentage of the TCE in the area was attributable to EMD. (RT 6572:19-6573:8.)

Based upon his analysis, Lambie estimated that if the District had incurred 3.5 million dollars in costs as part of the North Basin Groundwater Protection Project, Northrop's allocable share of that cost is 1.8%. (RT 6598:9-20.) Using the same methodology, Lambie was able to assign percentages to several other parties, namely, 2.6% to Aerojet, 6.5% to Johnson Controls, 0.5% to Chicago Musical, and 2.3% to AC

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[10] Accounting for natural attenuation required Lambie to adjust concentrations from sites by increasing concentrations in upgradient wells. This analysis resulted in Lambie allocating Northrop's EMD site a significant portion of the costs to remediate DCE. Lambie made clear, however, that if he were to assume (as did both Waddell and Tofani) that natural attenuation did not occur in the project area, he (like Tofani) would not have allocated any share to EMD because the unadjusted data shows no difference in contamination concentrations between the wells upgradient and downgradient EMD. (RT 6581:3-6582:1.) More importantly, both Lambie and Tofani agree that EMD is not a current source of contamination and that EW-4, the District's extraction well intended to capture contamination from EMD, is unnecessary. (RT 5341:2-5342:2; 6532:10-23.)

Products. (RT 6598:22-6604:11.)

Lambie's analysis was based upon the District's data, Fogg's modeling, and programs and methodology that are widely accepted by environmental scientists. Lambie's testimony was not impeached, and the District offered no testimony to rebut his conclusions. The evidence establishes a proper and reasonable basis for allocating 1.8% of the District's incurred remedial action costs (and any future remedial action costs) to Northrop.

B. A Reasonable and Proper Basis Exists for Allocation on Multiple Other Grounds

1. Waddell's Plume Maps

Apart from Lambie's cost allocation analysis, there are several other bases for reasonable allocation. Geographical considerations alone make a compelling case for allocation. All three Northrop sites are near the western edge of the Project area, downgradient almost every other site within the Project area. Waddell's own plume maps (Ex. 10146-53 and 10161) reflect multiple plumes, most of which are, with respect to Northrop, noncontiguous areas of contamination. Both of these plume maps demonstrate multiple separate areas of contamination unrelated to Northrop. By far the largest plume on both of Waddell's plume maps is the AC Products' PCE plume. (RT 2854:25-2855:1; 2766:7-11.) Waddell even admitted that estimates could be made as to the amount of contaminants in each separate plume. (RT 2769:23-2770:4.) Fogg also testified that there was sufficient data to perform a mass allocation for some sites (RT 3747:17-21.) It is clear from both Waddell's testimony and his plume maps that the plumes he attributes to the Northrop sites represent only a small percentage of the contamination to be remediated by the project.

2. Allocation by Extraction Well

The evidence presented also supports a geographical allocation based on the location of the five extraction wells and the extent to which these extraction wells are intended to capture contamination from the various defendants' sites. Of the five

extraction wells, it is undisputed (and Waddell himself has so testified) that extraction wells 1 and 2 will not capture contamination released at any Northrop site. Waddell opined that EW-3 will capture contamination from both Y-12 and Kester and that EW-4 will capture EMD contamination. As set forth above, however, the evidence is overwhelming that EMD is not a source of groundwater contamination and, therefore, EW-4 will not capture any EMD contamination. Thus, only one of the five extraction wells constructed to date, EW-3, could address groundwater contamination from the Northrop sites.

3. Mass Allocation Estimates

An even more compelling basis for an apportionment is the volumetric evidence. If Northrop is to be apportioned a share of the project costs, that share can only be based upon the cost to clean up contaminants used and released by Northrop. Northrop can have no liability for the costs to clean up contaminants not used nor released at any of the Northrop sites. Thus, Northrop cannot be allocated any share of the costs to clean up perchlorate, nitrates, dioxane, DCA, and TCP, because Northrop did not cause this contamination. As set forth more fully in the defendants' common brief, the District is responsible for the perchlorate and nitrate contamination. The dioxane contamination was caused by Vista Paint and/or UOP, and there is no evidence that Northrop (or any other defendant) caused DCA or TCP groundwater contamination.

The evidence has established that the cleanup costs for perchlorate are 9.3% of the project costs (RT 6546:13-17) and for nitrates, 16.6%. (RT 6547:3-6.) Similarly, the evidence has established that 11.1% of the project's costs are for dioxane treatment (RT 6546:2-5) and 10.1% are for TCP and DCA. (RT 6547:11-17.) Thus, costs to clean up chemicals of concern neither used nor released by Northrop amount to 47% of the total project costs. The District knew that around 50% of the costs of the project were not attributable to any PRP as evidenced by the District's 2005 budget for the project which reflected a 50/50 split of the capital costs between the District and PRPs. (RT 1507:17-1508:18.)

A volumetric allocation with respect to the remaining 53% of the cleanup costs is both feasible and reasonable with respect to Northrop. The three VOCs used and released by Northrop at its sites are PCE, TCE, and TCA, which has now biodegraded into DCE. As Lambie explained, the total combined mass of PCE, TCE, and DCE within the project area is 29,221 lbs., made up of 11,792 lbs. PCE, 13,772 lbs. TCE, and 3,657 of DCE. (Ex. 15912-75.) Northrop's total contribution to those three VOCs is 2,202 lbs. made up as 287 lbs. of PCE, 1,430 lbs. of TCE, and 485 lbs. of DCE. (Ex. 15912-76.) Northrop's contribution to the contaminant mass of these three VOCs in the project area, therefore, is approximately 7.6%.

Based on the above, Northrop's overall contribution to the total project costs is less than 4%, representing 7.6% of the 53% of costs required for PCE, TCE, and DCE contamination. This evidence establishes a reasonable basis to allocate to Northrop a share of no more than 4% of the costs incurred and to be incurred by the District in connection with the project.

4. Per Capita Allocation

A further basis for divisibility is a per capita approach based upon the likely number of PRPs responsible for the groundwater contamination in the aquifer. In *MTBE Products Liability Litigation,* (S.D.N.Y. 2006) 447 F.Supp.2d 289, the court held that where there were multiple defendants in the action, each defendant's contribution to the contamination was likely to be very small and that in itself was sufficient reason to support allocation. (*Id.* at 301.) The *MTBE* court noted that typically courts apply joint and several liabilities only in cases involving a small number of defendants. (*Id.* at 303).

More recently, the MTBE court revisited the matter and reaffirmed its ruling determining that even though there were less than 20 defendants, the number of defendants provided a sufficient basis for allocation. The court explained that "if ten manufacturers had an equal share in a spill, then there would still be too many tortfeasors to permit joint and several liability. The Restatement sets an even stricter limitation wherein it notes that no court has permitted joint and several liability in similar

circumstances when there were more than two or three tortfeasors." (*In Re MTBE Products Liability Litigation,* (S.D.N.Y. 2009) 643 F.Supp.2d 461, 468-469.)

Here, the evidence suggests multiple sites contributed to the groundwater contamination. Waddell himself identified more than 20 sites that he concluded were definitely sources of groundwater contamination and another nine or ten that were likely sources of groundwater contamination. (RT 1730:20-1731:9.) In addition, Waddell conceded that he had failed to adequately consider a number of drycleaners in the project area who had used PCE; he admitted that drycleaners are a notorious source of PCE contamination even when their PCE is properly discharged through the sewer system because sewer leakage is ubiquitous. (RT 2860:15-22; 2861:17-24; 2862:16-2863:4; 2864:5-8; 2865:15-18; 2866:6-15; 2866:26-2867:8; 2867:13-23; 2869:6-17; 2870:9-18.) Waddell also admitted that at the time he prepared his report, he was unaware of the existence of a number of drycleaners in the project area who used PCE and, consequently, he failed to consider them as a source of PCE contamination. (RT 2875:26-2876:9; 2877:7-26; 2878:7-23; 2875:6-14.)

Waddell also admitted that it was likely that there were as many as a hundred additional sites using VOCs that he had failed to consider. (RT 2880:24-2881:4.) Finally, he further admitted that it was very likely that more sites released VOCs to the subsurface causing groundwater contamination than had been identified by him in his report. (RT 2882:20-2883:2.)

As the *MTBE* court noted, even if there were only 10 sites that contributed to the groundwater contamination, that number itself would make it "fundamentally unfair to hold these defendants jointly and severally liable." (*In Re MTBE* Products Liability Litigation supra 447 F.Supp.2d at p. 303). Given the overwhelming likelihood that there are at least 30, but more likely something approaching 100 sites, that contributed to the contamination, no defendant should be allocated more than a percent or two of the Project costs to date (or in the future).

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C. In Any Event, Northrop's Liability Is Capped By the Cost of Modular Chlorinated Treatment

The District is seeking a declaratory judgment that defendants are jointly and severally liable for the future remediation costs incurred by the District during the District's normal processes for incurring such costs. As set forth above, and assuming that any centralized treatment is reasonable and necessary, Northrop's share of any costs that have been incurred or will be incurred by the District in connection with the remediation project is either 1.8% or 4.0%, depending upon the method used to allocate. However, Northrop's liability should not exceed what it would have cost to install VOC only remediation (approximately $1 million capital cost per system).

Tofani testified that EMD is not contributing to groundwater contamination and that no remediation is required at EMD. He testified, however, that if one were to assume that remediation is required to capture contamination from EMD, the cost today of a remediation system (both capital and O&M costs) operated for 30 years would be $6,500,000 if the system included treatment for dioxane, and $4,000,000, if it did not. (RT 5344:1-11.) He calculated this cost using the District's own proposed treatment system for standalone (modular) wellhead treatment. (RT 5344:12-5345:13.) That treatment system was fully designed by the District and in 2001, and its Board even approved installation of the system to be located immediately downgradient of Y-12 to clean up Y-12 and other upgradient contamination. (RT 5346:11-20; 5347:19-22.) The treatment system was not implemented however because the District failed to exercise its powers of condemnation to acquire the property on which the system was to be installed and then decided to modify the system and adopt a centralized treatment plant approach because of the discovery of perchlorate. (RT 5347:23-5348:7.) Adam Hutchinson, the project manager at the time, admitted that the site chosen for location of the extraction well would have been a good location for an extraction well and confirmed that it was the discovery of perchlorate in other portions of the project area that caused the District to abandon the modular system. (RT 4558:8-4560:1.) Virginia Grebbien, the general

manager of the District at the time, testified that she had recommended approval of the site chosen for location of the extraction well and had also approved the installation of the modular wellhead treatment system because it was cost effective. (RT 1530:2-11.)

Tofani testified that the cost to install that system today (whether for EMD or Y-12), would be $6,500,000, inclusive of O&M and inclusive of advanced oxidation treatment for dioxane. He calculated this cost by adjusting the District's 2002 estimate of $1,300,000 to present day cost using the producer's price index, which incorporates cost increases in all of aspects of the labor and materials that were included in the project. (RT 5346:21-5347:18; 5349:1-26.)[11] To confirm the accuracy of his calculation, Tofani also sought out quotations for some of the materials that would be used in the system. (RT 5482:12-23.)

Tofani testified that this system could easily be employed at a location suitably downgradient EMD and that, in fact, AC Products is presently operating a similar system. (RT 5348:8-26.) Waddell himself acknowledged that the system operated by AC Products has successfully resulted in significantly reducing contamination levels and that the system is effective. (RT 1758:2-10.) Tofani testified that EW-4 could be operated as a self-contained system as originally proposed by the District utilizing the existing wells that have been installed. (RT 5352:20-25.) Tofani testified that at EMD, running the system for nine years would be sufficient under any circumstances to complete adequate remediation. The cost of operating the system for nine years would be $4,100,000 as opposed to $6,500,000 if the system were to run for 30 years. (RT 5351:13-24.) These costs include the costs of 1,4-dioxane treatment. If 1,4-dioxane treatment were not included, the cost of operating the system for nine years would be $3,000,000 and $4,300,000 if the system were to run for thirty years. (RT 5352:16-19; 5349:4-8.)[12]

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[11] The 1.3 million included costs to treat dioxane. Without dioxane treatment the cost would have been $912,000. (RT 5346:21-25.)

[12] As set forth above, the evidence is overwhelming that EMD is not the source of the dioxane that the District proposes to treat and that the most likely sources of that dioxane are Vista Paint and UOP.

A similar system could be installed and operated in the area of EW-3 to address Y-12 contamination and the cost of that treatment would be less than at EMD, namely, $4,300,000 if operated for thirty years, and $3,000,000 if operated for ten years (it is undisputed that advanced oxidation treatment for dioxane is not required for Y-12). (RT 5348:24-5349:8; 5352:16-19.) Tofani has estimated that it would take no more than ten years at that location to bring contaminant levels below MCL. (RT 5351:8-15.) There is, of course, no need to install any system in the area of EW-3 to address Y-12 contamination because Northrop has already installed its circulation well CW-1 in the same area and that well is effectively treating contamination from Y-12.

It is undisputed that no separate remediation system is required for Kester because Y-12 is immediately downgradient Kester and both Waddell and Tofani agree that any extraction well that captures Y-12 contamination will similarly capture Kester contamination. (RT 1341:14-17; 1433:25-1434:3; 5343:7-26).

Accordingly, if the court were to conclude that EMD is a source of contamination requiring treatment, the present value of the cost of installing and operating such a treatment system is between $3,000,000 and $6,500,000, depending upon whether the system is to operate for nine years or 30 years and whether Northrop should be responsible for the dioxane treatment. Similarly, if an additional treatment system is required for Y-12 and Kester, the cost of that system is between $3,000,000 and $4,000,000, depending upon whether the system operates for ten years or thirty years.

IV. CONCLUSION

For over twenty years, Northrop Grumman has diligently worked to remediate its sites. Moreover, even if OCWD never builds the Project, Northrop will, as required by the Regional Board, cleanup all remaining contamination caused by it.

The evidence shows that the Project was primarily motivated by OCWD's need to treat nitrate and perchlorate contamination caused by OCWD itself and not any historic releases by Northrop. The cost for that regional project cannot be foisted on a private party absent a showing of causation. OCWD has failed to meet that burden and its first

two causes of action should be dismissed accordingly and judgment entered for Northrop.

DATED: September 5, 2012 LEWIS BRISBOIS BISGAARD & SMITH LLP

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